

necessarily possess, or can readily obtain, a more intimate knowledge of the circumstances of each student than can the Board. The scholarships now provided by local authorities offer in many places the further assistance required. In these circumstances I do not consider it desirable that the decision of the Board be reconsidered." It would be interesting to know how many national scholars receive any assistance from local authorities or have any resources beyond the 25s. per week now allowed them by the Board. Certainly it is desirable for local bodies to supplement the value of national scholarships, but while the Board of Education and local authorities are evading responsibility for support, the students who have not the additional resources referred to by Sir W. Anson have to cultivate high thinking on very poor living. The only satisfactory solution of the difficulty is the provision of a hostel or residential college so that students may learn something of the corporate life which should be an essential part of a university education.

### SOCIETIES AND ACADEMIES.

#### LONDON.

**Chemical Society, February 17.**—Dr. W. A. Tilden, F.R.S., president, in the chair.—The following papers were read:—Observations on some intramolecular and originally reversible changes extending over prolonged periods of time: R. J. **Friswell**. It was suggested (1) that the labile condition is not confined to hydrogen, and (2) that the constitution of a compound may vary according to the particular "stress" to which it is subjected. Experiments illustrating these points were described, such as the slow decomposition of aniline hydrochloride by aminoazobenzene even in presence of excess of aniline.—Note on magnesium oxybromide: G. W. F. **Holroyd**. This substance was obtained by saturating an ethereal solution of magnesium phenyl bromide with acetylene, when it separated in the form of colourless crystals consisting of one molecule of the oxybromide with two molecules of "ether of crystallisation."—The arrangement in space of the groups combined with tervalent nitrogen atoms: F. S. **Kipping** and A. H. **Salway**. The authors have attempted to detect asymmetry in a number of tervalent nitrogen compounds by treating these with *d*-*l*-benzylmethylacetylchloride. The products of these reactions remained homogeneous after fractional crystallisation, whence they conclude that the three radicles and the tervalent nitrogen atom itself in such compounds are situated in one plane, and that each pair of the radicles is symmetrically situated with regard to the third.—The esterification of *r*-mandelic acid by menthol and borneol: A. **McKenzie**. The esters obtained were described.—Certain organic phosphorus compounds: A. E. **Dixon**. Phosphorus trithiocyanate, a colourless oil readily hydrolysed by water into phosphorous and thiocyanic acids, and phosphoryl trithiocyanate, a pale yellow, highly refractive oil, were obtained respectively by the action of phosphorus trichloride and phosphorus oxychloride upon ammonium thiocyanate. These substances behave both as thiocyanates and thiocarbimides, and this tautomerism is being further investigated.—Note on the relation between the chemical composition of some organic substances and the densities of their solutions: C. E. **Fawsitt**. Determinations of the densities of solutions of homologous carbamides, amines and acids have shown that this property is of an additive character, though slightly modified by constitutional influences.—The so-called hydrocellulose: A. L. **Stern**. It was shown that the pulverulent substance formed by the action of dilute acids upon cellulose contains soluble hydrolytic products, and that the bulk of the material has the same composition as cellulose.—(1) Isomeric change of diacylanilides into acylaminoketones; (2) intramolecular rearrangement in derivatives of the aromatic aminoketones: F. D. **Chattaway**.

**Royal Microscopical Society, February 17.**—Dr. Hy. Woodward, F.R.S., vice-president, in the chair.—A paper by Mr. **Stringer** on an attachment for reading the lines in a direct vision spectroscopic was read. The attachment consists of a light rigid arc of phosphor-bronze of about 40 degrees and  $6\frac{1}{4}$  inches radius, cast in one piece with two radial arms that project from a broad ring, by which

it is clamped to the body of the instrument. It lies just below the telescope, which is traversed across the spectrum by a screw that works through one of the radial arms and presses against a lug projecting downwards from the telescope to which it is clipped. A spring attached to the other radial arm acts on the opposite side of the lug and forces the telescope back when the motion of the screw is reversed. The arc carries a millimetre scale, divided in white on a black ground, and a vernier reading to tenths is carried by the telescope. Immediately below the eye-piece is a magnifying lens through which the scale and vernier can be read without any change in the observer's position.—A paper by Mr. **Nelson** on the vertical illuminator was then read. The author said that after lying in abeyance for twenty-five years, the vertical illuminator has lately come into notice for the examination of opaque objects and especially for the microscopic examination of metals. He said a vertical illuminator must not be an oblique illuminator only, but must be capable of illuminating the full aperture of the back lens with a parallel beam of light. It must not be a permanent attachment to an objective so as to impair its performance for ordinary work. The reflector must be placed near the back lens, and there must be some method for regulating the illumination. To obtain the best advantage with vertical illumination it is necessary to use oil immersion objectives.—Another paper by Mr. **Nelson** on the influence of the antipoint on the microscopic image shown graphically was read. The author referred to a paper in the *Journal* for 1903 on a micrometric correction for minute objects, wherein he stated by way of illustration that if one of the minute spinous hairs on a blow-fly's tongue was examined on a bright ground and on a dark ground, a considerable difference in the sizes of the two images was discernible, and that the difference was caused by antipoints. A table was also given showing the amount to be added to the micrometric measurements of the image seen on the bright ground to bring it up to its true value. Mr. Gordon, who had originated the theory of the antipoint, had made accurate drawings of the two images of the hair, and the ratio of the breadths of the hair in these drawings was as 45 to 65. Applying the corrections given in the table to the measurement of the apparent size of the hair on a bright ground, the actual size works out to 12 per cent. more.—Mr. Keith **Lucas** followed with a paper on a microscope with geometric slides. He defined a geometric slide as one in which each motion which is not desired is separately eliminated by a single stop so arranged as not to interfere with any other possible motion. This principle he had applied in the design of a microscope to the slides of the fine and coarse adjustments and to the substage.

**Royal Meteorological Society, February 17.**—Captain D. Wilson-Barker, president, in the chair.—Mr. E. **Mawley** presented his report on the phenological observations for 1903. He showed that owing to the mildness of the winter and early spring wild plants flowered in advance of their average dates until about May, after which time only backward dates were recorded. In no previous year since the present series of reports was first instituted, in 1891, have such spring migrants as the swallow, cuckoo, and nightingale been so late in reaching our shores. The yield of wheat, barley, potatoes, turnips, and swedes was somewhat under average, but all the other farm crops yielded well, especially those of hay and beans, which were unusually abundant. On account of the wet and protracted harvest most of the grain of the cereals was more or less discoloured, while potatoes were almost everywhere much diseased. Throughout the country this was one of the most disastrous years for fruit ever known. In fact, the only crop which gave anything like an average yield was that of strawberries.—Mr. W. H. **Dines** gave an account of the observations which he had made by means of kites at Crinan, off the west coast of Scotland, during last summer. These observations were carried out by Mr. Dines under the auspices of a joint committee of the Royal Meteorological Society and of the British Association, the Government Grant Committee of the Royal Society providing funds for the hire of a vessel for the purpose. The author, after describing various improvements which he had effected in the kites, stated that the weather last summer was most un-

favourable for kite flying, as not only was there heavy rain-fall, but gales were of frequent occurrence. The results of the observations show that in August last the mean temperature gradient for the first 5000 feet was  $3\frac{1}{2}$  per 1000 feet. This is substantially the same as that obtained during the preceding summer, although the conditions of weather were very different.

**Linnean Society, February 18.**—Prof. S. H. Vines, F.R.S., president, in the chair.—Mendel's laws and their application to wheat hybrids: R. H. Biffen. An investigation of the various characters of the different races and varieties of wheat showed that the following characters were dominant:—beardless paleæ, keeled glumes, lax ears, velvet chaff, grey coloration, red coloration in the chaff and red coloration in the grain, the corresponding recessive characters being bearded paleæ, rounded glumes, dense ears, glabrous chaff, white coloration in the chaff and grain. Evidence was brought forward to show that certain anatomical characters, such as the presence of groups of bristles, the arrangement of sclerenchyma girders, the presence or absence of pith in the internodes, also followed Mendel's laws. The same also appears to be true of certain "constitutional" characters, such as the time of ripening and the immunity to attacks of rust.—Mr. W. Bateson, F.R.S., exhibited a series of *Primula sinensis*, about 240 in number, lent by Messrs. Sutton and Sons, illustrating the phenomena of heredity and variation which he had been permitted to witness in their nurseries during five seasons. As was well known, the species, since its introduction about 1820, had given off numerous mutational forms, e.g. fern-leaved, ivy-leaved, the "*stellata*" type, and others. Many of these in their inheritance follow simple Mendelian rules.

**Anthropological Institute, February 23.**—Mr. H. Balfour, president, in the chair.—The Hon. W. L. Allardye, C.M.G., delivered a lecture on the Fijians in peace and war. The lecturer directed attention to the native legend of the colonisation of the islands, and pointed out the presence of two types, a Melanesian and a Polynesian. Passing to their domestic life, he described their methods of personal adornment, houses, food, industries, and canoes. He then gave an account of the punitive expedition of 1894, in which he had taken part, and described the native methods of warfare. Finally, he gave a very interesting description of the fire-walking ceremony on Mbengha.

**Physical Society, February 26.**—Dr. R. T. Glazebrook, F.R.S., president, in the chair.—A new dilatometer, exhibited by Mr. B. Bonniksen, was described by Mr. B. F. E. Keeling. The instrument was originally designed for measuring the expansion of balance-wheels of watches, and has latterly been applied to the determination of the coefficient of dilatation of specimens of materials, used in the form of wires about  $1\frac{1}{2}$  inches in length. The increase in length with change in temperature is magnified about 1500 times by means of a chain of accurately mounted gear-wheels, the last one of which moves a pointer over a circularly graduated scale. With an ordinary specimen of steel one degree rise in temperature causes a movement of the pointer over about one-third of a scale-division, and a mean coefficient of expansion of such a substance over a range of  $100^{\circ}$  C. can be obtained to about 1 per cent. in a single experiment of five minutes' duration.—A quartz-thread vertical force magnetograph: Dr. W. Watson. The instrument resembles, in principle, the quartz-thread gravity balance of Prof. Threlfall. In addition to the advantages derived from the suppression of the knife-edge, the instrument can be simply and accurately compensated for the effects of changes of temperature. The principle of the instrument is to have a magnet suspended on a horizontal quartz fibre kept stretched by means of a spring. The centre of gravity of the magnet and the torsion of the fibre are so adjusted that the axis of the magnet is horizontal. Any variation of the vertical force produces a rotation of the magnet about the fibre which can be suitably recorded by means of a mirror attached to the magnet. The temperature compensation is effected by weighting the magnet on the same side of the axis of the fibre as the south pole, so that the magnetic couple and the couple due to the torsion of the fibre act in the same direction. Hence, since an increase in temperature causes one of these couples to decrease and the other to increase, by suitably adjusting

the weight, and therefore the magnitude of the torsion couple, complete compensation can be obtained. The suspended system in the instrument shown at the meeting consists of two magnets 8 cm. long and 1 mm. diameter attached by means of small platinum straps to two fused rods of silica, which form part of the plate of fused silica forming the mirror. The upper surface of the mirror is platinised. The fixed mirror is supported on the base of the instrument, and is capable of adjustment.—On stresses in a magnetostatic field: G. W. Walker. Quincke found that when a glass bulb containing a solution of ferric chloride was placed between the poles of a strong electromagnet, the level of the liquid, in a capillary tube attached to the bulb, fell. This has been held to require for its explanation a system of stress which differs from the magnetic stresses of electrical type. The object of this paper is to show that the experiment can be quite well explained by the stresses of electrical type.—Dr. W. Watson gave some hints on the preparation of diagrams.—Mr. R. J. Sowter exhibited a portable electroscope of high insulation and adapted to show and measure the discharging effect of radio-active substances.

**Zoological Society, March 1.**—Dr. A. Günther, F.R.S., vice-president, in the chair.—Dr. A. Günther, F.R.S., exhibited and made remarks upon some specimens of hybrids between Reeves's pheasant (*Phasianus reevesi*), ♂, and the silver pheasant (*Euplocamus nycthemerus*), ♀.—Mr. Oldfield Thomas, F.R.S., exhibited and made remarks upon the skull of a buffalo which had been obtained by Colonel Delmé-Radcliffe in south-west Uganda. The horns differed in certain respects from those of *Bubalus caffer*, and Mr. Thomas considered the specimen to represent a distinct local race and entitled to subspecific rank. Mr. Thomas also exhibited a specimen of a fruit-bat from Fernando Po, which he described as a new species of the genus *Scotonycteris*.—Mr. J. G. Millais exhibited a series of skins illustrating the life-history of the grey seal (*Halichoerus grypus*), and made remarks upon its geographical distribution.—Mr. J. Follitt Darling exhibited photographs of, and made remarks upon, a very large specimen of the woolly monkey (*Lagothrix humboldti*) which he had observed in southern California.—Dr. Walter Kidd exhibited a drawing of, and read a note on, the arrangement of the hair on the nasal region of the parti-coloured bear (*Heluropus melanoleucus*).—Mr. R. E. Holding exhibited and made remarks upon a double head of a lamb and the skull of a Spanish four-horned ram fractured in fighting.—Mr. E. R. Sykes read a fourth instalment of Sir Charles Eliot's paper entitled "On some Nudibranchs from Zanzibar and East Africa." It contained an account of twenty-two species of Dorididae Cryptobranchiata, of which eight were described as new.—A communication from Mr. Robert T. Leiper contained a detailed account of the turbellarian *Avagina incola*, which had recently been described by the author, and a note on the classification of the Proporida.—Dr. Einar Lönnberg contributed a paper on two specimens of hybrid grouse between *Lyrurus tetrix* ♂ and *Lagopus lagopus* ♀.

CAMBRIDGE.

**Philosophical Society, February 15.**—Dr. Baker, president, in the chair.—On the occurrence of radio-active constituents in common substances: Prof. J. J. Thomson. The author described the results of the examination of a large number of specimens of water from different parts of England. In nearly every case the radio-active gas which occurs in Cambridge tap-water, and is probably identical with the emanation from radium, was present. In order to find the source of this gas a number of clays, gravels, and sands were examined, and it was found that in many of these radium was present. Radium was found in garden soil from the laboratory garden, in the Cambridge gault, in gravel from a pit at Chesterton, in still greater quantities in sand from the sea-shore at Whitby, in the blue lias at Whitby, in powdered glass, in one specimen of flour, and in a specimen of precipitated silica; other specimens of flour and silica did not contain any appreciable amount of radium. The question whether ordinary metals such as tin, bismuth, platinum and lead give off a radio-active emanation was investigated; no trace of such an emanation could be found even when the metals were in the exceedingly finely divided



state in which they occur in colloidal solutions, and were exposed to the bombardment of Röntgen and kathode rays. Although ordinary substances do not give off a radio-active emanation, reasons are advanced for believing that they give out rays similar to Röntgen rays.—On the temperature effect on the rate of combination of hydrogen and chlorine: P. V. **Bevan**.—On the convection of heat: H. A. **Wilson**.—On the calculation of capacities in terms of the coefficients of electrostatic induction: G. F. C. **Searle**.

## DUBLIN.

**Royal Dublin Society**, February 16.—Mr. W. E. **Wilson**, F.R.S., in the chair.—Prof. E. J. **McWeeney** described his recent investigations on the distribution of *Bacillus coli communis*, *Bacillus enteritidis sporogenes*, and Streptococci in shell-fish, sand, and sea-water from various points on the Irish littoral, with special reference to the value of these organisms as evidence of sewage-contamination. The author began by referring to the evidence that had convinced hygienists that shell-fish, and especially oysters, may serve as vehicles for pathogenic organisms, especially those of enteric fever. It is along with other organic matters of sewage origin that these bacilli gain access to the oyster, hence the necessity for establishing some test whereby the actual contamination of shell-fish with sewage, and, inferentially, their potential contamination with specific disease germs, may be recognised. With this object he had, under the auspices of the Local Government Board for Ireland, carried out a systematic bacterioscopic examination of shell-fish, water and mud, collected by Dr. Browne from the several layings round the Irish coast. A leading feature of the work was its independence of the local inspection conducted by Dr. Browne. Each oyster was tested for coli and enteritidis, the quantity of the mingled shell-water and body-fluid tested being as a rule 1 c.c. The author very much doubted the positive value of enteritidis, but considered that its absence was a valuable evidence of purity. Both it and coli were absent from deep-sea oysters. Enteritidis was present in nearly 100 per cent. of oysters from a polluted locality when, for some unknown cause, coli was not demonstrable. In view of the occasional occurrence of coli in material from unpolluted localities, to condemn a laying on the strength of its presence in a few oysters from a chance batch was, in his opinion, unjustifiable. The occurrence of coli in a large percentage of molluscs from an apparently pure locality was to be taken as a danger signal, indicating the need for renewed and more stringent local inspection. The author considered that the delimitation of the species-idea *B. coli communis* was of much importance. With regard to the characters of *B. enteritidis sporogenes*, the author was in agreement with Klein.—Mr. W. B. **Wright** and Mr. H. B. **Muff** communicated a paper upon the pre-Glacial raised beach of the south coast of Ireland. A raised beach resting on a wave-worn platform which subtends an old cliff has been traced along the south coast of Ireland from Carnsore Point to Cape Clear. The beach is overlaid by "head" or "rubble drift," and by the Boulder-clays of the Irish Sea and west Cork ice-sheets. It fringes the shores of the drowned river-valleys, proving their pre-Glacial submergence. It is similar to the raised beaches on the shores of the Bristol and English Channels, and to that near Bridlington, Yorkshire.—Dr. F. G. **Donnan** read a paper on the reactivity of the alkyl iodides. This was a discussion of the relative reactivities of the saturated aliphatic iodides as measured by the determination of velocity-coefficients in a homogeneous medium. The experiments of Wislicenus, Menschutkin, Hecht, Conrad, and Brückner, and those carried out by Miss K. A. Burke and the author were discussed in this connection, and their bearing on Nef's dissociation hypothesis pointed out.

## PARIS.

**Academy of Sciences**, February 29.—M. Mascart in the chair.—The president announced to the academy the death of M. Émile Laurent, correspondant for the section of rural economy.—On quadratic forms invariant by a given linear substitution (mod.  $p$ ): Camille **Jordan**.—On a condition necessary for the initial stability of any elastic medium whatever: P. **Duhem**.—On a new species of  $n$ -rays: R. **Blondlot**. These rays are differentiated from the  $n$ -rays by the fact that they diminish the luminosity of a phosphor-

escent calcium sulphide screen instead of increasing it. They are present, along with the  $n$ -rays, in the light of a Nernst lamp, formed into a spectrum by means of an aluminium prism. Measurements of the refractive indices and wave-lengths are given.—Peculiarities presented by the action of the  $n$ -rays on a feebly lighted surface: R. **Blondlot**. On a phosphorescent or feebly lighted screen the effect of  $n$ -rays is to increase the luminosity when the screen is viewed normally, to diminish it when viewed very obliquely. The  $n$ -rays, described in the previous note, have exactly the opposite effect.—On the transparency of certain bodies for the  $n$ -rays: E. **Bichat**. Silver is transparent, and palladium, nickel and iridium opaque, for all the radiations. Other metals are transparent for some wave-lengths and opaque for others.—Particular cases in the emission of the  $n$ -rays: E. **Bichat**. Liquids under pressure emit  $n$ -rays, the gases above them do not, and it is possible in this way to trace the change at the critical point by means of a phosphorescent screen.—Observation of the occultation of a star made on February 24 at the Observatory of Toulouse: L. **Montangerand**.—On the continued deformation of surfaces: G. **Tzitzéica**.—On the friction of pivoting: L. **Lecornu**. After a comparison of the expressions deduced by Léauté and by Hertz, a demonstration is given of the correctness of the former.—Method for the experimental study of the secondary movements of vehicles in motion: M. **Sabouret**.—On the diastoloscope and the results obtained by it: C. **Chabrie**. A description of a magnifying instrument in which the lenses are replaced by cones. The images are highly magnified, but distorted in a regular manner.—The stato-voltmeter, an apparatus capable of measuring electromotive forces over a range of from 2 to 40,000 volts: V. **Crémieu**.—On the magnetic rotation of the plane of polarisation of the  $n$ -rays: H. **Bagard**. From the minuteness of the wave-lengths of the  $n$ -rays, as determined by M. Blondlot, it is probable that the phenomenon of magnetic rotatory polarisation would be shown by these rays in a much higher degree than for ordinary light. This was found by experiment to be the case.—The action of magnetic fields on phosphorescent substances: C. **Gutton**. An increase in the lustre of a phosphorescent screen is observed whenever variations in the intensity of a magnetic field produce a displacement of the lines of force in the neighbourhood of the screen.—Appearance of the sparks given by a coil with a Wehnelt interruptor on closing or opening the primary current: M. **Gagnière**.—On entanglement by coagulation: Jacques **Duclaux**.—Theoretical study of the dissociation of oxyhæmoglobin. The effects of concentration and temperature: Victor **Henri**. By the application of van 't Hoff's equation and the measurements of Berthelot on the heat of combination of oxygen with reduced blood, the variations of the dissociation constant with temperature are calculated.—On a cadmium arsenide: Albert **Granger**. Cadmium, heated in arsenic vapour carried over by hydrogen or an indifferent gas, forms a crystalline arsenide, of composition  $Cd_3As_2$ .—The combination of salts of dinaphthopyryl with di-alkylated aromatic amines: R. **Fosse**.—Ethylidene-camphor. Ethyl-homocamphoric acid: J. **Minguin**. A description of the preparation and properties of ethylidene-camphor. It shows a large increase in the rotatory power as compared with the corresponding ethyl-camphor, resembling in this respect the methyl compounds previously described.—On the synthesis of  $\alpha\alpha$ -dimethylglutaric and  $\alpha\alpha$ -dimethyladipic acids: G. **Blanc**. The reduction of  $\alpha\alpha$ -dimethylsuccinic ester by sodium in boiling alcohol gives a glycol, already described, and a lactone. The latter, heated in sealed tubes with potassium cyanide at  $270^\circ$  C., gives dimethylglutaric acid, identical with the acid obtained by the oxidation of isolaunonic acid.—The production of acetylmethylcarbinol by bacteria of the group *Bacillus mesentericus*: Henri **Desmots**. Acetylmethylcarbinol is produced by the action of several varieties of bacilli belonging to the group of *B. mesentericus*, and as this ketonic alcohol can be easily identified by means of its osazone, it may serve as a useful biochemical test.—On mother-of-pearl: Raphael **Dubois**.—The action of the  $n$ -rays on the senses, especially on the smell, and on the emission of the  $n$ -rays by substances possessing smell: August **Charpentier**. A body emitting the  $n$ -rays, when brought near the nose, sensibly increases the intensity of the sensation of smell. Conversely, such substances are capable of

emitting the rays, which can pass through aluminium and show the other properties of the  $n$ -rays.—On the pigment of the suprarenal capsules: C. Gessard. The chromogen of the suprarenal capsules, in the colourless state which results from the absence of oxygen, is the product of the action of tyrosinase on tyrosine. It becomes coloured on exposure to the air.—The action of the rays given off by phosphorescent calcium sulphide on the lactic fermentation: Charles Richet.—The mechanism of the movement of the wing in insects: Lucien Bull. It has been shown by Marey that the trajectory described by the end of the wing of an insect is a lemniscate, and has suggested that the deviation from a straight line is due to the resistance of the air. This view is now experimentally confirmed.—On the lignification of the subterranean organs of some plants in Alpine regions: André Dauphiné.—On the morphological phenomena of germination, and on the structure of the plantule in palms: C. L. Gatin.—On the hibernation of the mildew of the vine: G. de Istvanff.

## DIARY OF SOCIETIES.

### THURSDAY, MARCH 10.

ROYAL SOCIETY, at 4.30.—On Electric Resistance Thermometry at the Temperature of Boiling Hydrogen: Prof. J. Dewar, F.R.S.—A Study of the Radio-activity of certain Minerals and Mineral Waters: Hon. R. J. Strutt.—Some Uses of Cylindrical Lens-Systems: G. J. Burch, F.R.S.

ROYAL INSTITUTION, at 5.—Electrical Methods of Measuring Temperature: Prof. H. L. Callendar, F.R.S.

MATHEMATICAL SOCIETY, at 5.30.—On Inner Limiting Sets of Points: Dr. E. W. Hobson.—On the Unique Expression of a Quantic of any Order in any Number of Variables with an Application to Binary Perpetuants: Mr. P. W. Wood.—The Derivation of Generalised Bessel Coefficients from a Function Analogous to the Exponential: Rev. F. H. Jackson.—Illustrative Examples of Modes of Decay of Vibratory Motions: Prof. A. E. H. Love.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Railway Electrification Problem and its Probable Cost for England and Wales: F. F. Bennett.—The Rated Speed of Electric Motors as affecting the Type to be Employed: H. M. Hobart.

SOCIETY OF ARTS, at 4.30.—China Grass; its Past, Present, and Future: Frank Birdwood.

### FRIDAY, MARCH 11.

ROYAL INSTITUTION, at 9.—The Motion of Viscous Substances: Prof. F. T. Trouton, F.R.S.

ROYAL ASTRONOMICAL SOCIETY, at 5.—On the Determination of the Division Errors of a Graduated Circle: S. S. Hough.—On the Degree of Accuracy of the New Lunar Theory: E. W. Brown.—On the Comparison between the Purely Theoretical and Observed Places of the Moon: E. Nevill.—On the Relative Efficiency of Different Methods of Determining Longitudes on Jupiter: A. Stanley Williams.—Positions and Photographic Magnitudes of Ninety Stars surrounding the Variable R Cygni: J. H. Metcalf.—Note on the Instrumental Errors affecting Observations of the Moon: H. H. Turner.—Comparisons of the Geocentric Places of the Sun and Major Planets calculated from the Tables of the American Ephemeris Office with their Places calculated from Le Verrier's Tables for 1906: A. M. W. Downing.—Note on the Drawings of the Mare Serenitatis by John Russell, R.A.: S. A. Saunders.—Note on the Date of the Passage of the Vernal Equinox from Taurus into Aries: E. W. Maunder and A. S. D. Maunder.—Papers promised: On the Chromatic Correction of Object Glasses, Second Paper: A. E. Conrady.—Note on the Optical Defects of the Microscope of a Measuring Machine for Astronomical Photographs: H. C. Plummer.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Premium System of Payment for Labour: W. G. Banister.

PHYSICAL SOCIETY, at 8.—The Whirling and Transverse Vibrations of Shafts: Dr. C. Chree, F.R.S.—Notes on Non-homocentric Pencils, and the Shadows produced by Them—Part II. Shadows produced by Axially Symmetrical Pencils possessing Spherical Aberration: W. Bennett.

MALACOLOGICAL SOCIETY, at 5.—A *Résumé* of Recent Researches on the Structure of Pelecypod Gills: Dr. W. G. Ridewood.—Descriptions of two new Species of Opisthostoma from Borneo: E. A. Smith.—On some Non-Marine Hawaiian Mollusca: C. F. Ancey.—New Species of Mollusca from New Zealand: Rev. W. H. Webster.

### SATURDAY, MARCH 12.

ROYAL INSTITUTION, at 3.—The Life and Work of Stokes: Lord Rayleigh.

### MONDAY, MARCH 14.

SOCIETY OF ARTS, at 8.—Recent Advances in Electro-Chemistry: Bertram Blount. (Cantor Lecture, II).

### TUESDAY, MARCH 15.

ROYAL INSTITUTION, at 5.—The Doctrine of Heaven and Hell in Ancient Egypt and the Books of the Underworld: Dr. E. A. Wallis Budge.

ZOOLOGICAL SOCIETY, at 8.30.—Contributions to the Anatomy of the Lacertilia.—I. On the Venous System in certain Lizards: F. E. Bedford, F.R.S.—Note on the Skull and Markings of the Quagga: R. Lydekker, F.R.S.—On Additions to the List of Rhopalocera of Dominica: P. I. Lathy.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Barrage across the Nile at Asyut: G. H. Stephens, C.M.G.—The Use of Cement Grout at the Delta Barrage in Egypt: Sir R. H. Brown, K.C.M.G.

ROYAL STATISTICAL SOCIETY, at 5.—Statistics of London Traffic: E. J. Harper.

SOCIETY OF ARTS, at 4.30.—Recent Developments in Devonshire Lace Making: Alan S. Cole, C.B.

### WEDNESDAY, MARCH 16.

CHEMICAL SOCIETY, at 5.30.—Mercuric Nitrite and its Decomposition by Heat: P. C. Ray.—Note on the Higher Glycerides: J. B. Hannay.—The Nature of a Solution of Iodine in Aqueous Potassium Iodide: C. H. Burgess and D. L. Chapman.—The Reduction of 2:6-Dinitrotoluene with Hydrogen Sulphide: J. B. Cohen and J. Marshall.—Isomeric Change of Diacylanilides into Acylaminoketones. Transformation of the Dibenzoyltoluidines into the Isomeric Benzoylamino-toluophenones: F. D. Chattaway and W. H. Lewis.—Acid Esters of Methyl Substituted Succinic Acids: W. A. Bone, J. J. Sudborough, and I. H. G. Sprankling.—Action of Ethyl  $\beta$ -Iodopropionate on Ethyl Disodioacetylenetetra-carboxylate: O. Silberrad.

ENTOMOLOGICAL SOCIETY, at 8.

SOCIETY OF ARTS, at 8.—Artificial and other Building Stones: L. P. Ford.

ROYAL MICROSCOPICAL SOCIETY, at 8.—A Note on Some New Methods of Measuring the Magnifying Power of the Microscope and of Lenses Generally: Prof. A. E. Wright.—Exhibition of Hand-painted Lantern Slides illustrating Botanical Histology prepared by Mr. A. Flatters.

ROYAL METEOROLOGICAL SOCIETY, at 7.30.—Water Vapour: R. H. Curtis.

### THURSDAY, MARCH 17.

ROYAL SOCIETY, at 4.30.

LINNEAN SOCIETY, at 8.—On the Bryozoa from Franz Josef Land: A. W. Waters.—Natural-Colour Photographs of Living Insects and Flowers: F. Enock.

AERONAUTICAL SOCIETY, at 8.—Experiments with Aërial Screw Propellers: Major B. F. S. Baden-Powell.—The Beedle Airship: W. Beedle.—Mechanical Flight: Thomas Moy.

INSTITUTION OF MINING AND METALLURGY, at 8.—Annual General Meeting. Followed by Discussion on "The Equipment of Laboratories for Advanced Teaching and Research in the Mineral Industries."

### FRIDAY, MARCH 18.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Compound Locomotives in France: M. Edouard Sauvage.

### SATURDAY, MARCH 19.

ROYAL INSTITUTION, at 5.—The Life and Work of Stokes: Lord Rayleigh.

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